Remarks

The Examiner is thanked for the Final Office Action dated July 2, 2002. This amendment and request for reconsideration is intended to be fully responsive thereto.

The Examiner objected to the Amendment filed on April 16, 2002 under 35 USC § 132 because it introduced new matter; namely, "the thermal loop including *both* a gas cooler and a condenser". Applicant has amended claim 1 traversing the Examiner's objection. No new matter has been added.

The Examiner objected to the drawings under 37 CFR 1.83(a). The amendment to claim 1 deleting "a condenser", has traversed this objection. Therefore, no correction to the drawings is necessary.

The amended Abstract was objected to because its summary of the invention was not consistent with the claims. The Abstract has been amended in accordance with the Examiner's instructions. No new matter has been added. Applicant has also attached hereto a "clean" copy of the amended abstract.

The disclosure was objected to because of several informalities. The disclosure has been amended in accordance with the Examiner's comments. No new matter has been added.

The specification was objected to for minor typographical errors and idiomatic language. The specification has been amended, thus rendering this objection moot. No new matter has been entered.

The Title was objected to by the Examiner as being not descriptive of the claimed invention. Applicant has accordingly amended the Title. No new matter has been entered.

The Examiner rejected claims 1, 2, 7-11 and 17-23 under 35 USC 112, first paragraph, as containing subject matter not described in the specification. Claim 1 has been amended to traverse this rejection. No new matter has been entered. Claims 1, 2, 7-11 and 17-23 are now believed to be in conformance with 35 USC § 122, first paragraph.

The Examiner rejected claims 1, 2, 7-11 and 17-23 under 35 USC § 112, second paragraph, as being indefinite. The claims have been amended to address all of the Examiner's comments and objections. No new matter has been entered. Claims 1, 2, 7-11 and 17-23 are now believed to be in conformance with 35 U.S.C. 112.

Claims 1, 2, 7, 11, and 20-23 are rejected under 35 USC 102 (b) as being anticipated by Kenny et al. Applicant respectfully disagrees.

The Examiner erroneously alleges that (1) one of the evaporators of Kenny reads on the gas cooler as recited in the claims; and (2) the combination of either evaporator 152 and heater 100, or evaporator 82 and heater 28 read on the "single exchanger. In fact, evaporator is an apparatus for converting liquid into vapor, and cannot be interpreted as a gas cooler. Moreover, every air-conditioning installation necessarily includes both evaporator and gas cooler. More specifically, the installation of Kenny includes the evaporators 82 and 152, and the separate heat exchanger or condenser 92 functioning as the gas cooler. Thus, the evaporators 82 and 152 of Kenny cannot be interpreted as "gas coolers". Furthermore, the evaporators 82 and 152 and heaters 28 and 100 of Kenny are placed in tandem (see column 2, lines 46-48), and not formed into a single exchanger as recited in the claims. By contrast, the single exchanger of the present invention includes the single

core adapted for circulating both the heat-carrying fluid and the refrigerant fluid.

Thus, Kenny fails to disclose the gas cooler and the heating element grouped together into a single exchanger. Therefore, the rejection of claims 1, 2, 7, 11, and 20-23 under 35 USC § 102 is improper.

The Examiner rejected claim 8 under 35 USC § 103 as unpatentable over Kenny et al. in further view of Loup. Applicant respectfully disagrees. Claim 8 depends from claim 1 which the Applicant has traversed.

Attached hereto is a marked-up version of the changes made to the specification by the current amendment. The attached page is captioned "**APPENDIX OF CHANGES BY AMENDMENT**."

It is respectfully submitted that the application and claims are now believed to be in condition for allowance and notice to that effect is respectfully requested. Should the Examiner believe additional discussion would advance the prosecution of the present application, they are invited to contact the undersigned at the local telephone number listed below.

Respectfully submitted,

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In re ELLIOT, et al.
09/614,586

In re Application of: ELLIOT, et al.

Appl. No. 09/614,586 Group Art Unit: 3743

Filed: July 12, 2000 Examiner: CIRIC

Title: HEATING AIR CONDITIONING INSTALLATION FOR A MOTOR VEHICLE

APPENDIX OF CHANGES BY AMENDMENT

IN THE SPECIFICATION:

Please amend and center the Title of the invention as follows:

HEATING/AIR-CONDITIONING INSTALLATION FOR [A] MOTOR VEHICLE INCLUDING [AN AIR/HEAT CARRYING FLUID/REFRIGERANT-FLUID] MAIN MODULE FORMING FLUID-CARRYING HEAT EXCHANGER

Please amend the Abstract as follows:

ABSTRACT OF THE DISCLOSURE

A heating/air-conditioning installation for a motor vehicle has a thermal loop which includes a refrigerating compressor, [a condenser] a gas cooler, a pressure-reducing valve, an evaporator, and a heating element. The [condenser] gas cooler and the heating element are grouped together into a single exchanger including a main module forming a main [air/heat-] fluid-carrying [fluid/refrigerant-fluid] heat exchanger.

Please amend the paragraphs on page 3, lines 4-21 as follows:

- at least one surface [for exchanging or] providing an interface between the air and the heat-carrying fluid flowing through the main exchanger and/or at least one surface [for exchanging or] providing an interface between the air and the refrigerant fluid flowing through the main exchanger, and

- at least one surface [for exchanging or] providing an interface between the heat-carrying fluid and the refrigerant fluid of the thermal loop flowing through the main exchanger.

The main exchanger may consist of a stack of modules, each of which includes:

- an element for exchanging between the heat-carrying fluid and the refrigerant fluid of the thermal loop, having at least one surface in thermal contact with an element for interfacing with the air; and

- the element for exchanging or interfacing with the air.

According to a first preferred variant, the element [for exchanging or] providing an interface between the heat-carrying fluid and the refrigerant fluid successively exhibits:

Please amend the paragraphs on page 4, lines 1-30 as follows:

and in which the element [for exchanging and] interfacing with the air exhibits a first surface for interfacing with a second surface of the second heat-carrying fluid circulation element and a second surface for interfacing with a second surface of the first heat-carrying fluid circulation element of an adjacent module.

The element [for exchanging or] providing an interface between the heat-carrying fluid and the refrigerant fluid may successively exhibit: a third heat-carrying fluid circulation element having a first surface in thermal contact with a second refrigerant-fluid circulation element of the thermal loop; and the second refrigerant-fluid circulation element. In that way, the main exchanger exhibits surfaces for exchanging between the air and the heat-carrying fluid, between the air and the refrigerant fluid and between the heat-carrying fluid and the refrigerant fluid.

The main exchanger may include a collector of the heat-carrying fluid and a collector of refrigerant fluid of the thermal loop which are arranged at opposite ends of the exchanger.

The element [for exchanging or] providing an interface between the heat-carrying fluid and the refrigerant fluid of the thermal loop may exhibit at least one heat-carrying fluid circuit element for making the heat-carrying fluid circulate along an outwards and return path from and to the heat-carrying fluid collector and at least one refrigerant-fluid circuit element for making the refrigerant fluid of the thermal loop circulate, preferably at least partly counter to the flow of the heat-carrying fluid, along an outwards and return path from and to the refrigerant-fluid collector.

Please amend the paragraph on page 6, lines 10-11 as follows:

- an air-conditioning mode in which the main exchanger is traversed by refrigerant fluid and by overcooled water, and

Please amend the paragraph on page 9, lines 3-22 as follows:

The exchanger consists of a stack of modules 1 successively comprising an element 3_1, an element 2, an element 3_2, and an element 4 [for exchanging or] interfacing with the air which is generally formed from thin corrugated foil. The modules 1 are superimposed in such a way that the elements 4 have a surface for exchanging, on the one side 4', with an element 3_2 of a module 1, and, on the other 41 ', with an element 3_1 of an adjacent module 1. This structure particularly favors the exchanges between the water and the refrigerant fluid, all the more so since, as Figure lb shows, the elements 3_1 and 3_2 can be assembled in such a way as to surround the element 2 which is traversed by the refrigerant fluid. Moreover, and for a better thermal exchange, the circulation of the water and of the refrigerant fluid takes place along a U-shaped outwards and return path from a water collector 11 arranged at one end of the exchanger and from a refrigerant-fluid collector 12 arranged at the other end thereof. Moreover, the respective U-shaped paths are preferably arranged in such a way that the fluid currents (water and refrigerant fluid) circulate as far as possible counter to each other.

Please amend the paragraphs on page 12, lines 6-27 as follows:

In the air-conditioning mode, the mixing flap 49 is closed (position represented in Figure 3b) and the exchanger 42 is isolated from the airflow. The exchanger 42 is traversed both by the hot refrigerant which is leaving the compressor 41 and by the overcooled water ESR directed by the valve 46. The heat energy absorbed by the evaporator 45 is in that way disposed of to the outside by virtue of the overcooled water ESR which passes through the exchanger 42.

In the heating mode, the air conditioning is stopped and the exchanger 42 operates as a radiator which is traversed by the cooling water ERM from the internal_combustion engine of the vehicle.

In the de-misting mode, the air conditioning is turned on and the mixing flap 49 is in the open position represented in Figure 3a. If it is desired that the de-misting operation be accompanied by cooling, the flap 49 is partially open. If the operation is accompanied by a desired heating-up, it is possible to make hot water circulate through the exchanger 42, for example the cooling water from the engine ERM instead of the overcooled water ESR, which somewhat degrades the operation of the air conditioning and makes it possible to [stabilise] stabilize the system which is generally unstable at low thermal load.

IN THE CLAIMS

Please amend claims 1, 2, 7, 9, 17 and 22 as follows:

1. (Twice Amended) A heating/air-conditioning installation for a motor vehicle, comprising a thermal loop which includes a refrigerating compressor, a gas cooler, [a condenser,] a pressure-reducing valve, an evaporator, and a heating element, wherein the gas cooler and the heating element are grouped together into a single exchanger including a main module forming a main [air/heat] fluid-carrying [fluid/refrigerant-fluid] heat exchanger.

2. (Twice Amended) The installation of Claim 1, wherein the main fluid-carrying heat exchanger comprises:

- at least one surface for exchanging heat between [the] air and [the] a heat-carrying fluid flowing through the main fluid-carrying heat exchanger, and

- at least one surface for exchanging heat between the heat-carrying fluid and [the] a refrigerant fluid of a main loop flowing through the main fluid-carrying heat exchanger.

7. (Twice Amended) The installation of Claim 1, wherein the main fluid-carrying heat exchanger comprises:

- at least one surface for exchanging heat between [the] air and [the] a refrigerant fluid, and

- at least one surface for exchanging heat between [the] a heat-carrying fluid and the refrigerant fluid.

8. (Twice Amended) The installation of claim 1, wherein the main fluid-carrying heat exchanger includes a collector of a heat-carrying fluid and a collector of [the] a refrigerant fluid which are arranged at opposite ends of the main fluid-carrying heat exchanger.

9. (Twice Amended) The installation of Claim 8, wherein an element within the thermal loop exchanges heat [for exchanging] between the heat-carrying fluid and the refrigerant fluid comprises at least one heat-carrying fluid circuit element for making the heat-carrying fluid circulate along an outwards and return path from and to the heat-carrying fluid collector and at least one refrigerant-fluid circuit element for making the refrigerant fluid circulate along an outwards and return path from and to the refrigerant-fluid collector.

17. (Twice Amended) The installation of Claim 1, wherein the thermal loop further comprises an additional evaporator for operation in a heating mode[,] and a second routing circuit in order[, in heating mode,] to form a heat pump in the heating mode, the heat pump including the main fluid-carrying heat exchanger as [the condenser] gas cooler thereof [of which is the main exchanger] and the [evaporator of which is an] additional evaporator as an evaporator thereof.

18. (Twice Amended) The installation of Claim 1, wherein the thermal loop further comprises a third routing circuit in order[, in a thermal heating mode,] to form a heating loop in a thermal heating mode, the heating loop including the compressor and the main fluid-carrying heat exchanger, a

refrigerant-fluid outlet of the main fluid-carrying heat exchanger being coupled to an inlet of the compressor.

19. (Twice Amended) The installation of Claim 18, wherein further comprising a pressure-reducing valve arranged downstream of the main fluid-carrying heat exchanger.

20. (Twice Amended) The installation of Claim 1, wherein the thermal loop includes a supply device for supplying the main fluid-carrying heat exchanger either with at least one of cooling water and overcooled water.

21. (Twice Amended) The installation of Claim 20, further comprising:

- an air-conditioning mode in which the main exchanger is traversed by refrigerant fluid and by overcooled water, and

- a heating mode in which the main fluid-carrying heat exchanger is traversed by cooling water.

22. (Twice Amended) The installation of Claim 21, further comprising a mixing flap which, in the air-conditioning mode, is in a closed position in which the main fluid-carrying heat exchanger is isolated from [the] an airflow.

23. (Twice Amended) The installation of Claim 22, further comprising a de-misting mode in which the air-conditioning mode is activated, and in which the mixing flap is in an at least partially open position, so that the main fluid-carrying heat exchanger is traversed by at least a part of the airflow.